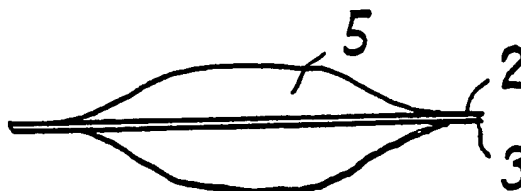




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/GB88/00954 (22) International Filing Date: 4 November 1988 (04.11.88) (31) Priority Application Number: 8726096 (32) Priority Date: 6 November 1987 (06.11.87) (33) Priority Country: GB (71) Applicants (for all designated States except US): KOSKA & WATTS LIMITED [GB/GB]; 42 Frederick Place, Brighton, East Sussex BN1 1AT (GB). MARKBEECH PACKAGING LIMITED [GB/GB]; The Old Vicarage, Markbeece, Edenbridge, Kent (GB). (72) Inventors; and (75) Inventors/Applicants (for US only) : KOSKA, Marc, Andrew [GB/GB]; Flat No. 2, Kentish Mansions, Royal Tunbridge Wells TN1 1DD (GB). HOLT, Eileen [GB/GB]; The Old Vicarage, Markbeece, Edenbridge, Kent (GB).		(74) Agents: KELTIE, David, Arthur et al.; Baron & Warren, 18 South End, Kensington, London W8 5BU (GB). (81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB, GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US. Published <i>With international search report.</i>

(54) Title: PACKAGE FOR WATER-CONTAINING SUBSTANCES



(57) Abstract

A filled package (1) for dissolution in water comprises a sealed water soluble packaging (2, 3) containing a concentrated aqueous syrup of at least one substance, the concentration of the at least one substance in the aqueous syrup being sufficiently high so that at storage temperature the water in the aqueous syrup does not attack or dissolve the packaging (2, 3) to the extent that over the desired storage period the package (1) is not ruptured.

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Package for water-containing substances.

1 The present invention relates to methods of
packaging, and packages of, water containing substances such as
foodstuffs, medicines, and other substances for human
consumption, and of water containing substances not
5 for human consumption such as agricultural chemicals,
in water soluble packaging.

It has long been desirable to present concentrated
water containing substances in the form of syrups,
such as honey; honey or sugar mixtures with alcoholic
10 drinks such as whisky or rum; honey or sugar mixtures
with soft drink essences; with flavourings for beverage
or culinary use; with drugs, particularly for pediatric
use; and with other fluid water containing substances
in convenience packaging containing a single known
15 measure and in which the packaging itself dissolves
in water. The advantages of such packaging are that the
contents may be precisely weighed in single dose
quantities and hermetically sealed ready for use.
Moreover, in use in dissolving in water because the
20 packaging itself can be put into the water and will
dissolve completely, the user has no messy packaging to
dispose of and can be sure that the entire contents of
the package have been mixed. Hence accurate formulation
of the desired end product can be achieved without
25 needing to weigh or measure often small amounts of
concentrated essence, flavouring, sweetner or the like.
This is especially important in dealing with consumers
and with sticky products such as honey and many pediatric
medicines, or potentially harmful products such as
30 agricultural chemicals.

1. In this specification the term syrup is used generically to include within its ambit concentrated aqueous solutions, precipitates or suspensions of any appropriate substance whether it be of a sweet, bland, sour, salt or
5 other tasting food substance or mixture of food substances, or be a pharmaceutical, medical, or agricultural chemical substance or mixture of substances.

Turning now to honey, by way of example, a large proportion of the current production of honey is used for sweetening hot or cold drinks. The syrupy nature of honey makes this operation more difficult than the use of granular sugar. This difficulty is most severe in commercial beverage dispensing, whether by beverage dispensing machines or in premises such as cafes and restaurants. Containers of honey available for customers' use will rapidly become contaminated with honey on their outsides making them sticky and unattractive.

Honey is difficult to extract from any small container which might be provided containing a small quantity of honey suitable for sweetening an individual drink. Previously also any flavouring essence of the drink has been added separately from the honey.

Granular sugar itself presents some disadvantages in use. It is a solid, and can

1 be slow to dissolve in water. It cannot be used with
flavouring essences in liquid form, in convenient
single use prepacks, in a form in which the packaging
does not have to be separately disposed of.

5 Salts, such as gravy and sauce mixes and meat extracts
have also not been sold in a single use form with the exception of solid
powdered cubes, for reasons similar to sugar; if they have
been sold as powders these require careful measuring,
and if liquid, then the packaging has to be disposed
10 of separately. Moreover, powdered gravy, sauce
and other food substances such as custard are difficult
to prepare without unpleasant and unpalatable lumps
in the final product. In the case of flavouring
essences, which are often in the form of concentrated
15 syrups, the small quantities to be used have often
been difficult to measure accurately, leading to
uneven use and flavouring from one use to another.

Medicines are often presented as syrups,
especially for pediatric applications, but such
20 medicines are messy to use, and the dose administered
varies with the size of the spoon used. Whilst
medicines are often presented in gelatin capsules,
these do not dissolve in the mouth and may be undesirable
in some formulations.

25 Even where a substance is not for human consumption,
it is useful to package it in packaging which can
dissolve in water, so that the packaging does not have
separately to be disposed of and so that messy or
dangerous substances do not have to be handled, yet can
30 be presented for use in precisely measured quantities.

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- 1 Examples of such substances include aqueous based
agricultural chemicals, for garden or farming use,
detergents, and toiletries such as bath foams.
Previously only solid or substantially water free
5 substances (less than 10% water) have been proposed for presentation
in water soluble packaging, although a laminated packaging
with a water insoluble inner surface has been proposed.
The disadvantage of the latter, especially for food
use, is the presence of an insoluble residue after
10 contact with water.

Although water soluble packaging films are
known and are commercially available, including films
of modified vegetable materials such as methyl
cellulose which are known to be edible and have been
15 approved for human consumption, and films of polyvinyl
alcohol, they have in the past, only been used for
packaging solids or fluid (flowable) substances
which are substantially free of unbound water. This
is because the water in water containing substances having substantial
20 amounts of free water dissolved the film. Indeed, it has
generally been considered that contact with fluid substances containing
more than 2% of water should be sufficient to produce at least gradual
dissolution of such films.

Accordingly, the main object of the present
invention is to provide packages of water containing
25 syrups, such as honey, in which the aforesaid
disadvantages are minimized or avoided.

Applicants believe that they have discovered a principle, which
is that the greater the concentration of the actual
substance of a water containing substance, i.e. a
30 syrup, then the greater the retention of the syrup

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1 inside water soluble packaging without dissolution
of the packaging. Whilst Applicants are not entirely
certain as to how the increased concentration
provides for retention with no dissolution without
5 further experiments it is thought that the underlying
principle involved may be osmosis.

In order to carry this principle into effect,
the present invention consists in
a method of packaging at least one water containing
10 substance in a water soluble packaging material in
which the at least one water containing substance is a
syrup which is contained within the packaging by
having a concentration which is sufficient to prevent
the water in the syrup from attacking and dissolving
15 the packaging until the packaging is wetted externally, by
water or water containing liquid. Hereinafter water
and water containing liquids, e.g. milk, will be
generically referred to as water.

By means of the invention syrups of foodstuffs
20 such as honey, medicines such as cough medicines, and
agricultural chemicals such as herbicides can be
retained within water soluble packages of water
soluble film until wetted by water when the package and
the syrup will be dissolved, leaving no residue of
25 the package behind.

It is indeed surprising that the invention has
made it possible to package honey and other concentrated
aqueous syrups in such packaging, the packages remaining
stable, i.e. dissolution is inhibited, until the user
30 wets them, e.g. by immersion in water.

1 Moreover, Applicants believe that if osmosis
is involved in syrup retention it will also be
involved in dissolution so that once the package
has been wetted externally with water, the dissolution of the
5 packaging and the dissolving of the syrup in the
water will take place far more rapidly, which constitutes
a considerable advantage.

From another aspect, the present invention also
consists in a package for dissolution water, comprising
10 a sealed water soluble packaging containing a con-
centrated aqueous syrup of one or more substances,
the concentration of the substance or substances in
the aqueous syrup being sufficiently high so that at
a normal storage temperature (typically room temperature)
15 the water in the aqueous syrup does not or is inhibited
from attacking or dissolving the packaging to the
extent that over the desired storage period the
package is not ruptured.

Where the substance is honey, it may be of any
20 consistency in which honey is usually available. The
consistency may therefore range from a flowable
liquid syrup (clear honey) to a stiff syrup containing
much precipitated sugar (set honey). The honey
may be mixed with other water soluble substances,
25 such as flavourings, essences, colouring, or
concentrated alcoholic beverages, such as whisky or
rum. Other substances, such as concentrated sugar
solutions, salts from meat extracts for sauces and
gravies, concentrated extracts of tea or coffee,
30 concentrated aqueous solutions of bath foams, detergents

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1 or agricultural chemicals such as herbicides may
be used in the present invention. Mixtures of
substances may also be used. Furthermore, in the
case of food substances such as gravies, sauces
5 and the like freedom from lumps is ensured, since the
solids in them are predissolved in water.

Sometimes the substances required to be
stored is not highly soluble in water, so concentrated
solutions cannot be achieved. In other cases, such
as a flavouring, essence or medicine, only a small
10 but carefully measured amount of the active
ingredient is required. Where either of these
occurs, a carrier such as honey, or a concentrated
sugar solution can be used to increase the bulk,
or to ensure that the concentration of the aqueous
15 syrup is sufficiently high that dissolution of or
attack on the packaging material during storage is
effectively prevented. It is immaterial that some
of the substances in the package may be in the form
of a precipitate, in suspension or in particulate
20 solid form such as powdered herbs.

The package may be adapted for dissolution
in hot water only, cold water only, or more
preferably in hot or cold water by the choice of a
suitable packaging material. The film used for
25 packaging should be adapted so that it dissolves
completely and does not form a gel at the highest
temperature at which the package may ordinarily
be immersed in water. Typically such temperatures
should be 85°C for hot beverages, gravies and
30 sauces, 65°C for bath water, and 45°C for cold beverages

1 and agricultural chemicals. The optimum characteristics
of such films should include a fairly rapid dissolution time.
at the normal temperature of immersion in water when
filled, with stirring or
5 shaking if appropriate. Increasing the film
thickness increases dissolution time.

Packaging materials are available having the
necessary solubility properties. Examples of these
are methyl cellulose films and polyvinyl alcohol
10 films. Methyl cellulose films or derivatives
thereof being made of a modified vegetable material
are particularly preferred as they are safe for
human consumption. Polyvinyl alcohol films should
only be used where the solution in the package is
15 not for human consumption, for example in weed
killers or bath foams. Preferably cast film should
be used as it has more consistent characteristics,
but extruded film may be used, if appropriate.
Moreover, any other appropriate water soluble
20 packaging materials may be used.

Such films have the advantage of being heat
sealable, allowing easy formation of sealed
packages containing aqueous syrups of virtually any
desireable size. The size of the package may be
25 for sweetening or flavouring an expected quantity
of liquid for consumption such as an individual
drink, or for an expected quantity of a sauce, or
as a precise dose of a medicinal compound, or in a
larger package for industrial culinary use or for
30 packaging a measured quantity of an agricultural

1 chemical.

A further advantage of the invention for
culinary and beverage use is that both honey and
modified vegetable materials in particular methyl
5 cellulose are thickeners. Thus where it is
desired to create a relatively viscous food, beverage or other
packaged product according to the invention, the
appropriate amount of thickener can be incorporated
in the packaged substances, or by increasing the
10 thickness of the packaging film or by a combination
of both. The combination is determined by the
speed of dissolution of the packaging, thicker
packaging taking longer to dissolve, up to a maximum
effective thickness, and the degree of added
15 viscosity required. It is a novel feature of this
invention that the packaging material can be used
not only to contain the foodstuff or other product,
but also as a thickener for the foodstuff or
other product. This feature is particularly useful
20 for cold drinks, sauce mixes and gravies, to give
them body.

The honey or other syrup may be packaged into
such packaging material by any of the methods for
packaging liquids in plastics film packages conven-
25 tionally used. These will include drawing a base
sheet of plastics film by vacuum into wells to
provide pockets which may be filled with the honey
or other syrup and heat sealing a second layer of
plastics over the first layer to provide joined
30 packages which may then be separated for individual

1 sale or may be sold in the joined form for separation
by a user. The shape of the mould may be any
suitable form for marketing purposes, such as
hexagonal for efficient use of the packaging material,
5 round, square, or in the shape of an animal or
fruit. The surface of the film may be smooth, stippled
or textured.

Similarly, packages may be formed by the
technique of continuously forming a strip of film
10 into a vertically running tube, continuously filling
the tube with honey or other syrup, pinching and
sealing the tube at spaced intervals horizontally
to form a series of linked packages, and optionally
separating the packages.

15 The film may have incorporated in it flavouring
or colouring, and may have printing on it or
lettering or other motifs moulded into it. Where
appropriate, the flavouring, colouring or printing
ink shall be fit for human consumption. The film
20 may also have incorporated in it other additives,
to decrease oxygen permeability, and thus to
increase the shelf life of the packaged product.

The package may be provided with an
internal and/or external water soluble coating
25 which may be e.g. a sugar or salt for example.

It is preferred that in the packaging method
adopted, the film is sealed to itself when necessary
by heat sealing. However, the use of adhesives is

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- 1 also acceptable provided, where appropriate the
adhesive is fit for human consumption.

The syrup may be contained in an
5 individual package which may optionally
be connected by the packaging material to other
similar packages. Where the packages are inter-
connected in this way, they are preferably separable
from one another, e.g. by means of weak sections
10 or perforations in the packaging material joining
the said packages.

In order that the invention may be more
readily understood, reference will now be made,
by way of example, to the accompanying drawing,
15 in which:-

Figure 1 is a plan view of one embodiment
of a package which is made in accordance with the
invention, and

Figure 2 is an end view of the package of
20 Figure 1.

As shown in Figure 1, a package according to
the invention comprises packaging in the form of a
sachet 1 composed of upper and lower sheets of
polyvinyl alcohol or methylcellulose film 2, 3 joined
25 together in a zone forming a continuous rectangular
path 4 by heat welding to enclose a pocket 5
containing a concentrated aqueous syrup such as
honey.

A sachet of this form containing honey may
30 be dissolved in a drink for sweetening the drink

1 and imparting a honey flavour.

By selecting the grade and nature of the film enclosing the sachet, it may be soluble in a cold drink such as milk, as well as in hot drinks.

5 The invention will now be further described with reference to the following Examples in which a number of suitable syrups

contained in heat sealed tubular sachets of methylcellulose were made.

- 1) Honey alone
- 2) Sugar alone
- 3) Honey and rum
- 4) Honey and whisky
- 5) Honey and vanilla essence
- 6) Honey and blackcurrant flavouring
- 7) Honey and concentrated orange juice
- 8) Honey and Paracetamol (TM)
- 9) Honey and instant coffee (Nescafe (TM))
- 10) Honey and Chivas Regal (TM)
- 11) Honey and alcohol
- 12) Honey and fresh lemon juice

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1 13) Bovril (TM) meat extract

14) Marmite (TM)

As purchased solutions of

15) Honey and bath foam (Fenjal - TM)

5 16) Honey and liquid detergent (Fairy - TM)

It was found that all packages readily dissolved in water.

Where it is desirable that the packages of the invention not be handled, they may be stored in and
10 dispensed from a dispenser.

It should be understood that many modifications and variations may be made without departing from the scope of the invention. For instance, the packaging may be of any other appropriate material than
15 those described, need not be in the form of a flexible film, but may be of a stiffer nature imparting some structural rigidity to the package. Additionally, the requirement of wetting the outside of the package to dissolve it may be satisfied by water from the inside
20 of the mouth, the stomach, or other similar sources.

25

30

CLAIMS

- 1 1. A filled package for dissolution in water,
comprising a sealed water soluble packaging
containing a concentrated aqueous syrup of at least one
substance, the concentration of the at least one substance
5 in the aqueous syrup being sufficiently
high so that at storage temperature the water in the
aqueous syrup does not attack or dissolve the
packaging to the extent that over the desired storage
period the package is not ruptured.
- 10 2. A package as claimed in claim 1, in which the
packaging consists of a heat sealable flexible film.
3. A package as claimed in claim 2, in which the
gelation temperature of the film is greater than the
temperature at which the packaging is to be
15 dissolved after storage.
4. A package as claimed in any one of claims 1 to
3, in which the filled packaging is heat sealed
to form an hermetic seal.
5. A package as claimed in any one of claims 1 to
20 4, in which the packaging acts as a thickener to
the dissolved filled package.
6. A package as claimed in any one of claims 1 to 5,
in which the packaging material has an internal and/or
external water soluble coating to assist in retention of
25 the syrup in the packaging.
7. A package as claimed in claim 6, in which the
coating is a sugar.
8. A package as claimed in claim 6, in which the
coating is a salt.
- 30 9. A package as claimed in any one of claims 1 to 8,

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- 1 in which the packaging material is methyl cellulose
or derivatives thereof.
10. A package as claimed in any one of claims 1 to
9, in which both the packaging material and syrup
5 are edible.
11. A package in accordance with any one of claims
1 to 10, in which the syrup contains honey, or mixtures
of honey with other substances.
12. A package in accordance with any of claims 1 to
10 10, in which the syrup contains sugar or mixtures
of sugars, alone or in admixture with other substances.
13. A package in accordance with any one of claims
1 to 10, in which the syrup contains at least one of
the following; a flavouring, an essence, a salt such
15 as a meat extract, a medicine or a beverage
concentrate.
14. A package as claimed in any one of claims 1
to 13, in which the packaging material contains a
colouring and/or flavouring.
- 20 15. A package as claimed in any one of claims 1 to
8, in which the film is polyvinyl alcohol.
16. A package as claimed in any one of claims 1
to 9 or claim 15, in which the syrup contains or
consists of a toiletry or agricultural chemical
25 substance.
17. A package as claimed in any one of the preceding
claims, in which the packaging material contains
a colouring.
18. A package as claimed in any one of the
30 preceding claims, in which the packaging material

1 includes additives to suppress oxygen penetration
through the packaging material.

19. A package as claimed in any one of claims
1 to 18, wherein the at least one water containing
5 substance also contains a thickener.

20. A package as claimed in claim 19, in which
the packing material and the thickener are the same
or different material.

21. A method of packaging at least one water
10 containing substance in a water soluble packaging in
which the at least one water containing substance is
a syrup which is contained within the packaging
material by having a concentration of the substance
which is sufficient to prevent the water in the
15 syrup from attacking and dissolving the packaging
material until the packaging material is wetted externally by
water.

22. A method as claimed in claim 21, in which the
packaging material is provided with an internal
20 and/or external water soluble coating which assists
in retention of the syrup within the packaging
material.

23. A method as claimed in claim 21 or 22, in
which the packaging material is made from a
25 modified vegetable material.

24. A method as claimed in any one of claims 21
to 23, in which the packaging acts as a thickener
to the syrup.

25. A method as claimed in any one of claims 21
30 to 23, wherein the syrup includes a thickener which
is the same or different material as that of the
packaging material.

- 1 26. A method as claimed in claims 21 to 25, in
which the dissolution temperature of the packaging
is from about 45°C to about 85°C.
- 5 27. A method as claimed in claims 21 to 25, in
which the dissolution temperature of the packaging
is about 45°C.
28. A method as claimed in claims 21 to 25, in
which the dissolution temperature of the packaging
is about 65°C.
- 10 29. A method as claimed in claims 21 to 25, in
which the dissolution temperature of the packaging
is about 85°C.
30. A method as claimed in claims 21 to 29, in
which the syrup includes a carrier such as a sugar,
15 honey or a salt for the active ingredient of the
substance.
31. A package as claimed in any one of claims 1 to
20, in which the syrup includes a carrier such as a
sugar, honey or a salt for the active ingredient of
20 the substance.

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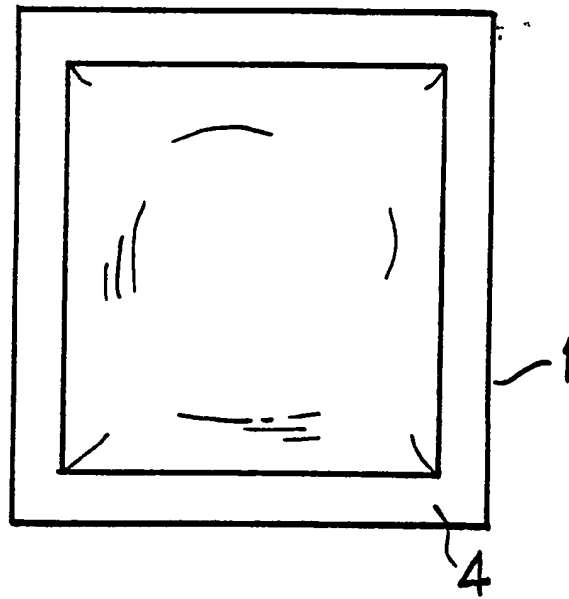


Fig.1

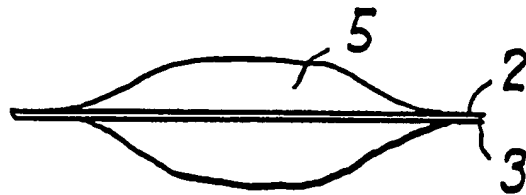


Fig.2

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 88/00954

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁴ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : B 65 D 65/38; A 23 L 1/08; A 23 F 5/24																				
II. FIELDS SEARCHED <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; margin: 5px 0;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%; border-bottom: 1px solid black;">Classification System</th> <th style="border-bottom: 1px solid black;">Classification Symbols</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">IPC⁴</td> <td style="padding: 5px;">B 65 D; A 23 F; A 23 L</td> </tr> </table> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; margin: 5px 0;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸</div>			Classification System	Classification Symbols	IPC ⁴	B 65 D; A 23 F; A 23 L														
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; border-bottom: 1px solid black;">Category ⁹</th> <th style="border-bottom: 1px solid black;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="border-bottom: 1px solid black;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">X</td> <td style="padding: 5px;">EP, A, 0244084 (A.C. BALL) 4 November 1987 see figures 1-3; column 1, lines 14-25, 35-37; column 4, line 50 - column 5, line 55; claims 1-3,8</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1,2,4,16, 21</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="text-align: center; vertical-align: top; padding: 5px;">--</td> <td style="text-align: center; vertical-align: top; padding: 5px;">3,5-10,14, 15,17,18, 22-30</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">US, A, 3322674 (J. FRIEDMAN) 30 May 1967 see figures 1,2; column 1, lines 40-62; column 1, line 71 - column 2, line 6; column 2, lines 19-24,35-47, 63-68; column 3, lines 7-10; column 5, lines 37-44</td> <td style="text-align: center; vertical-align: top; padding: 5px;">3,6,8,9, 15,18,22, 23,26-29</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">FR, A, 2087185 (ROUSSELOT KUHLMANN S.A.) 31 December 1971 see page 1; lines 21-39; page 3, lines 25-34; page 4, lines 5-13</td> <td style="text-align: center; vertical-align: top; padding: 5px;">5,7,10,14, 17,24</td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 5px;">-- ./.</td> <td></td> </tr> </tbody> </table>			Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	X	EP, A, 0244084 (A.C. BALL) 4 November 1987 see figures 1-3; column 1, lines 14-25, 35-37; column 4, line 50 - column 5, line 55; claims 1-3,8	1,2,4,16, 21	Y	--	3,5-10,14, 15,17,18, 22-30	Y	US, A, 3322674 (J. FRIEDMAN) 30 May 1967 see figures 1,2; column 1, lines 40-62; column 1, line 71 - column 2, line 6; column 2, lines 19-24,35-47, 63-68; column 3, lines 7-10; column 5, lines 37-44	3,6,8,9, 15,18,22, 23,26-29	Y	FR, A, 2087185 (ROUSSELOT KUHLMANN S.A.) 31 December 1971 see page 1; lines 21-39; page 3, lines 25-34; page 4, lines 5-13	5,7,10,14, 17,24	-- ./.		
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X	EP, A, 0244084 (A.C. BALL) 4 November 1987 see figures 1-3; column 1, lines 14-25, 35-37; column 4, line 50 - column 5, line 55; claims 1-3,8	1,2,4,16, 21																		
Y	--	3,5-10,14, 15,17,18, 22-30																		
Y	US, A, 3322674 (J. FRIEDMAN) 30 May 1967 see figures 1,2; column 1, lines 40-62; column 1, line 71 - column 2, line 6; column 2, lines 19-24,35-47, 63-68; column 3, lines 7-10; column 5, lines 37-44	3,6,8,9, 15,18,22, 23,26-29																		
Y	FR, A, 2087185 (ROUSSELOT KUHLMANN S.A.) 31 December 1971 see page 1; lines 21-39; page 3, lines 25-34; page 4, lines 5-13	5,7,10,14, 17,24																		
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>																				
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;"> Date of the Actual Completion of the International Search 1st February 1989 </td> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;"> Date of Mailing of this International Search Report 23 FEB 1989 </td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;"> International Searching Authority EUROPEAN PATENT OFFICE </td> <td style="border-bottom: 1px solid black; padding: 5px;"> Signature of Authorized Officer P.C.G. VAN DER PIJPEN </td> </tr> </table>			Date of the Actual Completion of the International Search 1st February 1989	Date of Mailing of this International Search Report 23 FEB 1989	International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer P.C.G. VAN DER PIJPEN														
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International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer P.C.G. VAN DER PIJPEN																			

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X	EP, A, 0199034 (R.P. SCHERER GmbH) 29 October 1986 see abstract; page 2, line 27 - page 3, line 30; page 5, lines 9-22	1,4,10,11- 13,19,20, 31
Y	-----	30,25

ANNEX THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 8800954
SA 25112

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 15/02/89
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A- 0244084	04-11-87	None	
US-A- 3322674		GB-A- 954602 US-A- 3186869	
FR-A- 2087185	31-12-71	None	
EP-A- 0199034	29-10-86	DE-A- 3546452	08-12-88